

FINKEL'SHTEYN, M.O. (Kuybyshev (obl.), Nekrasovskaya ul., 20, kv.39)

Voins of the glossal mucosa in man. Arkh. anat., gist. i embr. 42
no.3:108-114 Mr '62. (MIRA 15;5)

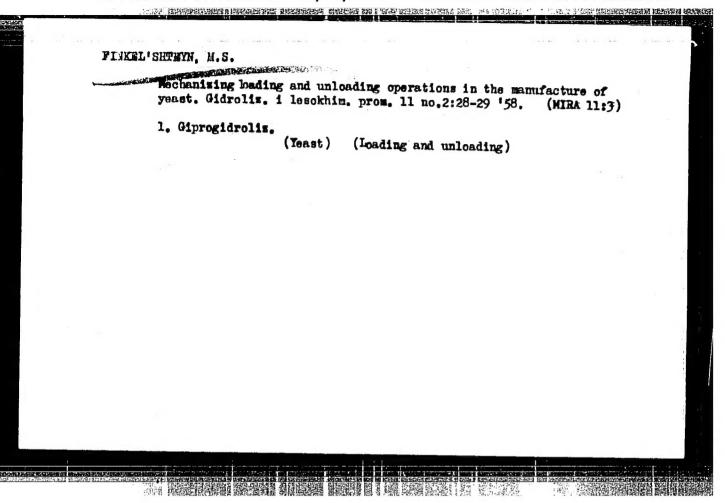
1. Kafedra normal'noy anatomii (zav. - prof. F.P.Markinov) Kuybyshev-skogo meditsinskogo instituta.

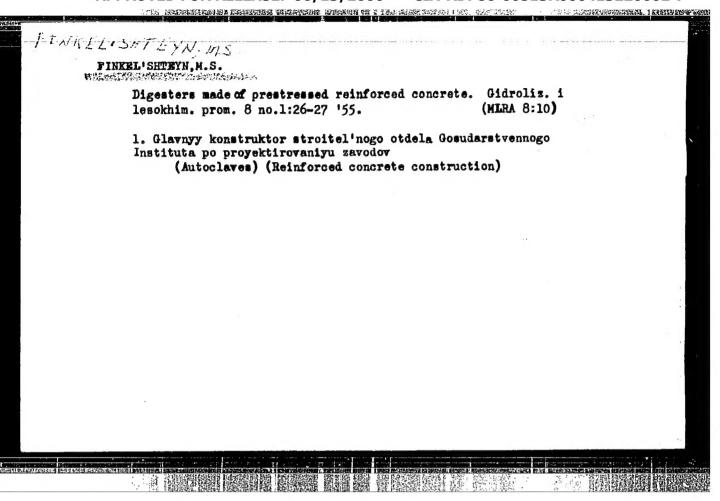
(VEINS) (TONGUE—BLOOD SUPPLY)

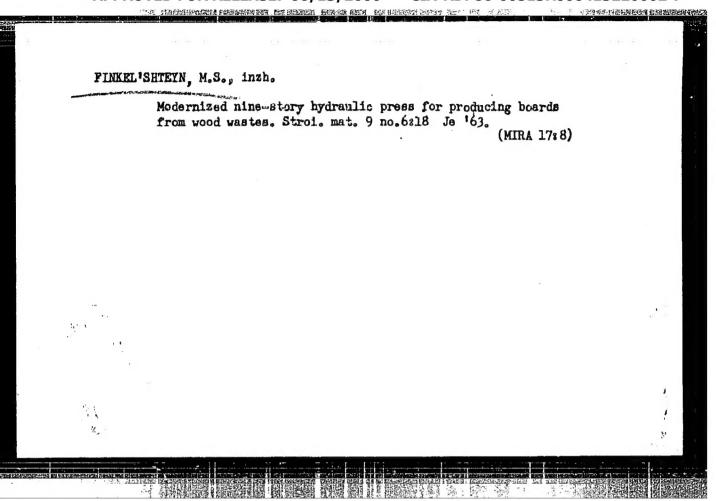
FINKEL'SHTEYN, M.O. (Kuybyshev (obl.), Nekrasovskaya ul., 20, kv.39)

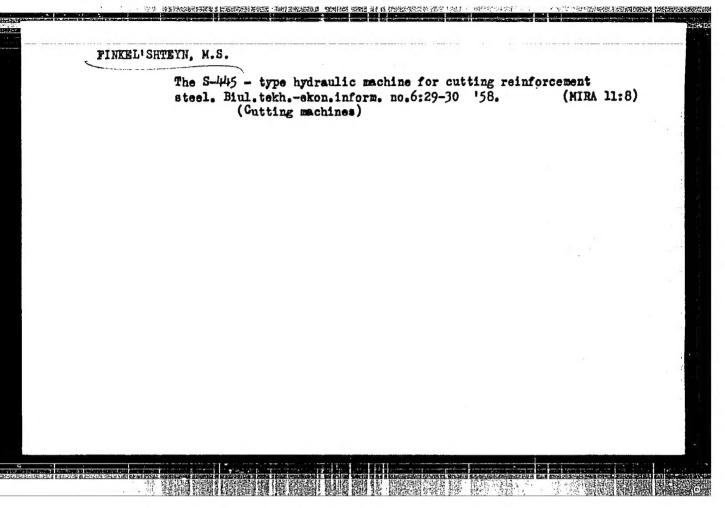
So-called venous sinuses in the spinal canal under normal conditions and following the disconnection of the caudal vena cava from the heart. Arkh. anat., gist. i embr. 44 no.2:72-79 F '63. (MIRA 17:2)

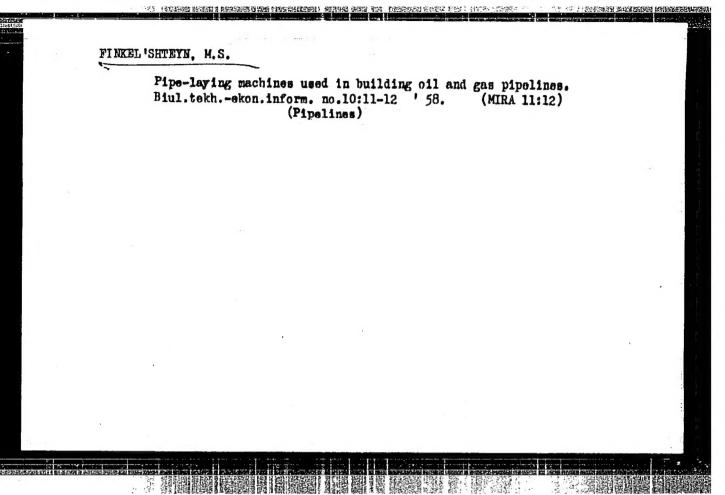
l. Kafedra normal'noy anatomii (zav. - prof. F.P. Markizov) Kuybyshevskogo meditsinskogo instituta.

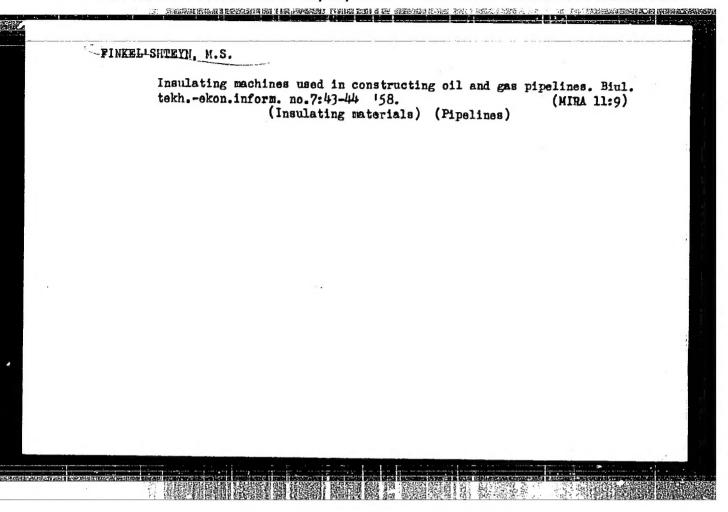


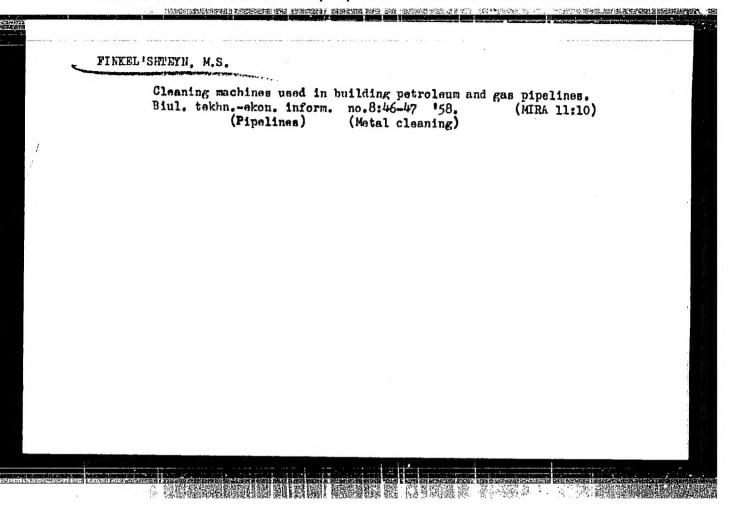


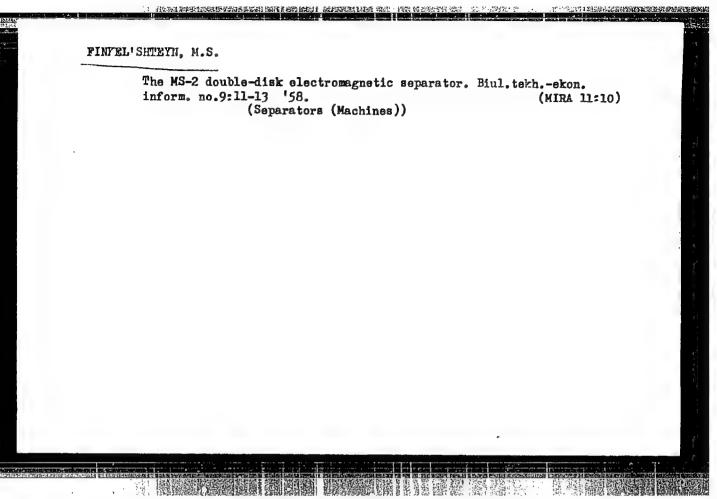


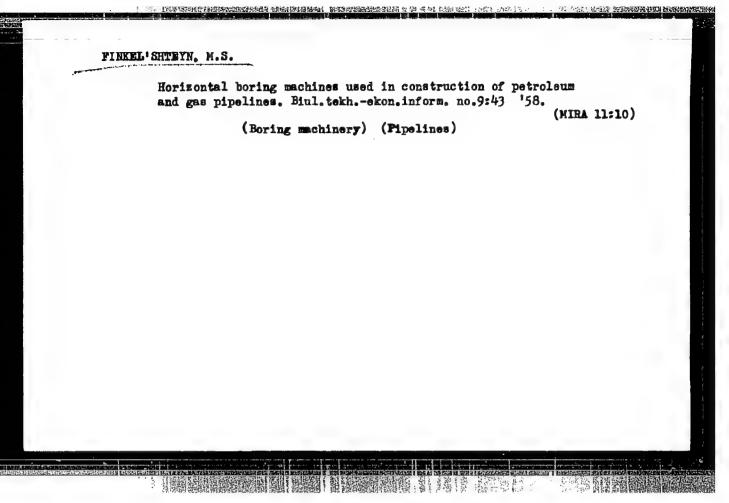












FINKEL'SHTEYN, M.S.; NIKOLAKHIN, M.G.

The OVPT-500 turbo-pump high-pressure unit. Biul. tekh.-ekon. inform. no.10:38-41 '59. (MIRA 13:3) (Steem turbines)

\$/193/60/000/006/009/015 A004/A001

AUTHOR:

Finkel'shteyn, M.S.

TITLE:

The O(NT-320 (OSPT-320) Turbine Pump Assembly

PERIODICAL:

Card 1/3

Byulleten' tekhniko-ekonomicheskoy informatsii, 1960, No. 6, pp.

36 - 38

The Leningradskiy mashinostroitel nyy zavod "Ekonomayzer" (Leningrad "Ekonomayzer" Mechanical Engineering Plant) has designed and brought out a prototype of the superhigh-pressure OSPT-320 turbine pump assembly. The assembly has been devised for operation in expanding power-stations of normal pressure fitted with superhigh-pressure units for the feeding of boilers with 220 atm steam pressure and temperature superheating of 400°C. The turbine pump assembly is composed of the following independent units: an active-type steam turbine driving the assembly units, a feed pump delivering the feed water to the boiler, a reducer reducing the number of revolutions from 8,500 (turbine rotor) to 4,400 (main oil pump) rpm, a steam box with valves and servomotors for steam distribution, the lubrication system, including lubrication pumps, filters, oil tank coolers and oil pipings, and the automatic control and protection units. The steam turbine

The OCAT -320 (OSPT-320) Turbine Pump Assembly

S/193/60/000/006/009/015 A004/A001

and feed pump are mounted on individual frames and connected by a gear clutch. The steam passage of the turbine has eight single-rimmed pressure stages, the first of which being the regulating stage. The mean diameters of the stages are in the range of 454 - 470 mm. The regulating stage has four nozzle groups, two groups in the upper and lower halves each. The main and auxiliary nozzle groups are actuated in dependence from the counter pressure magnitude (1.2 and 1.5 atm) and turbine load (80 and 100%). The turbine has a seamless forged rotor made of alloyed steel. The eight impeller disks and the shaft are made in one piece. The turbine stator consists of the body and turbine cover and the body and cover of the exhaust pipe. The feed pump has four impellers. The water enters the suction chamber through the intake pipe, subsequently passes all the stages, gets into the ring-shaped hollow and, through the pressure pipe, is delivered to the feed mains of the boiler. The pump rotor is not dismountable and consists of the shaft, four impellers, jacket, face end suction and pressure seals and discharging disk. The lubrication system ensures the compulsory lubrication of all bearings, gears and clutches and also supplies pressurized oil to the control and protection system. The control and protection unit of the turbine pump assembly is composed of: the pressure governor, which reacts on pressure variations behind the first stage of the feed pump and, through a hydraulic connection, acts on the piston of the

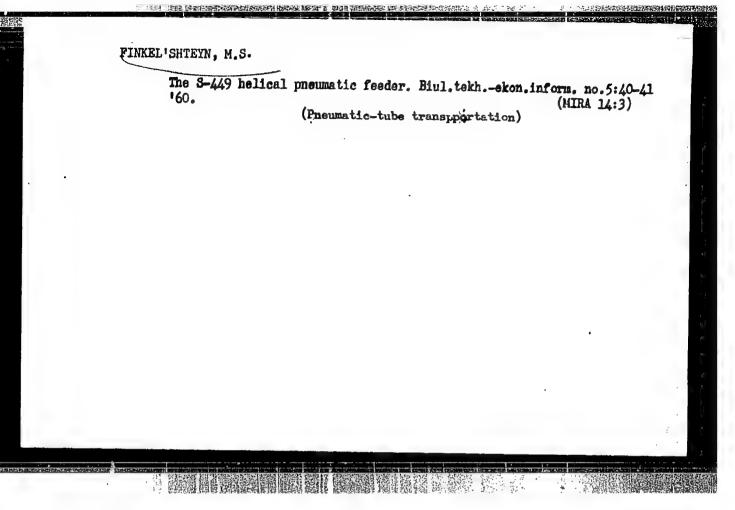
Card 2/3

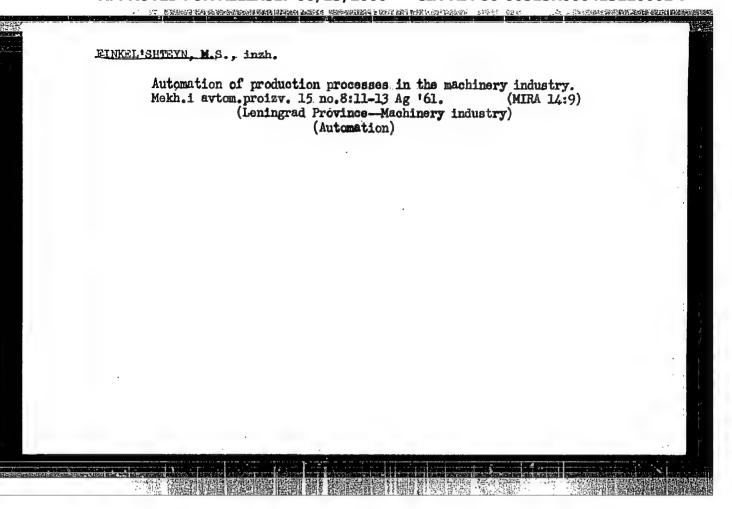
The OCNT -320 (OSPT-320) Turbine Pump Assembly

S/193/60/000/006/009/015 A004/A001

servomotor of the governing valve, the start valve, actuated by an electromotor via reducer, the oil mains connected to the servomotor of the governing valve, an electromagnetic valve, whose slide is displaced when the electromagnet starts working and which acts on the servomotor of the cut-off valve. The electric circuit of the installation provides for a signalization of the positions of the stop-valve, start valve and blow-through valves, of an increase in injection pressure and of a superheating of the thrust bearing higher than 60°C. The following technical data are given: pump capacity - 380 m²/h; injection pressure - 280 atm; temperature of condensate being pumped - 228°C; pressure at the suction pipe - 50 atm; rpm of the feed pump - 8,500; weight of the turbine pump assembly 13,500 kg; turbine specifications; capacity - 340 kw; pressure of live steam before the stop valve - 29 atm; temperature of live steam before the stop valve - 29 atm; temperature of live steam before the stop valve - 400°C; exhaust steam pressure - 1.2/1.5 atm; steam consumption - 24.0-29.7 ton/h; governing system of the turbine pump installation makes it possible to increase the efficiency by 12.5% since the necessary power is maintained for the given conditions of boiler operation.

Card 3/3





FINKEL'SHTEYN, M. YA.

The Effectiveness of and the Conditions Required for the Application of Phosphobacterins." I. I. Samoylov, E. F. Berezova, A. S. Chernavin, V. V. Bernard, Yu. M. Voznyakovskaya, L. M. Dorosinskiy, R. A. Menkina, and M. Ya. Finkel'shteyn. Trudy Vseosyuz. Nauch-Issledovatel. Inst. Sel'skokhoz. Mikrobiol. 8, 173-92(1953). Application of phosphobacterins is beneficial to a variety of crops, particularly cereal grains and potatoes, especially in black soil. In soils other than black, the presence of org. matter and of the perennial-grass stratum influence the effectiveness of the added phosphobacterins. Soil treatment with phosphobacterins increases the content of available P in the soil, especially in zones abutting the roots, intensifies the nitrification procrss and raises the nitrate content of the soil throughout the vegetation period, and increases the content of P in the plants. B.S. Levine

USSR/Soil Science - Organic Fertilizers.

J-4

Abs Jour

Ref Zhur - Biol., No 9, 1958, 39026

Author

Finkelshtein, M. Ja.

Inst Title

The Increase in Effectiveness of Organic-Mineral Mixture.

Orig Pub

Udobreniye i urozhay, 1996, No II, 27-29.

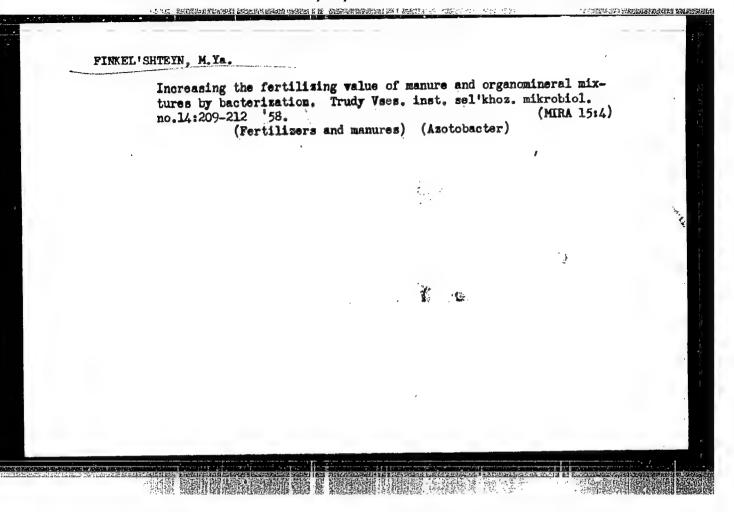
Abstract

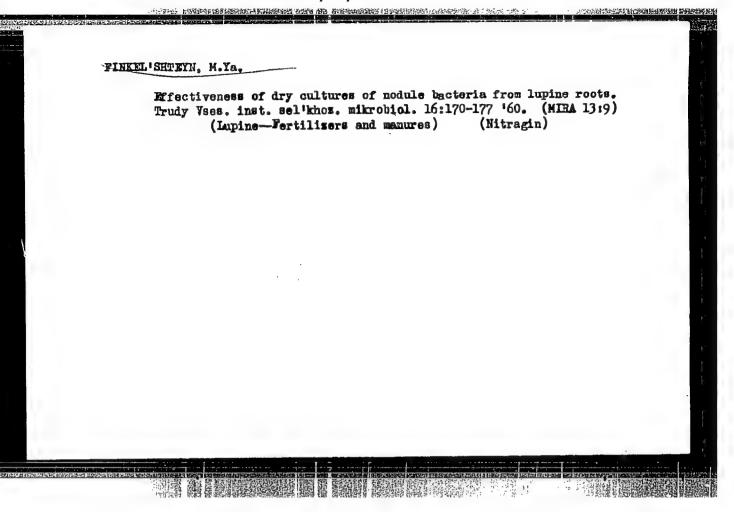
: A field experiment was conducted on dark-colored soil in the Vladimirskiy district conducted by Yur ev-Polskiy base of the Vses. in-ta s.-kh mikrobiologii. The experiment consisted in the addition to the organic-mineral mixture (manure - phosphates - dolomite powder) of armonium nitrate in a dose of 20 kr N or of ammonium molybdate in a dose of 100 g/ha. As a result the activity of all groups of microorganisms and the crop of oats increased

by 6.9 by using N and by 1.4 c/ha by using Mo.

Card 1/1

- 15 -





PINKEL'SHTEYN, M. Ya., kand.biolog.nauk

Dry nitragin and its use. Zemledelie 23 no.6:53-55 Je '61.

(MIRA 14:6)

1. Moskovskoye otdeleniye Vsesoyuznogo nauchno-issledovatel'skogo instituta sel'skokhozyaystvennoy mikrobiologii.

(Soil inoculation)

FINKEL SHTEYN, M.Ya., kand.biologicheskikh nauk; OVCHINNIKOVA, G.G.

CONTROL OF SHEET PRODUCTIONS STATE OF SHEETS

Effectiveness of treating legumes with nitragin. Zemledelie 24 no.4:67-68 Ap '62. (MIRA 15:4)

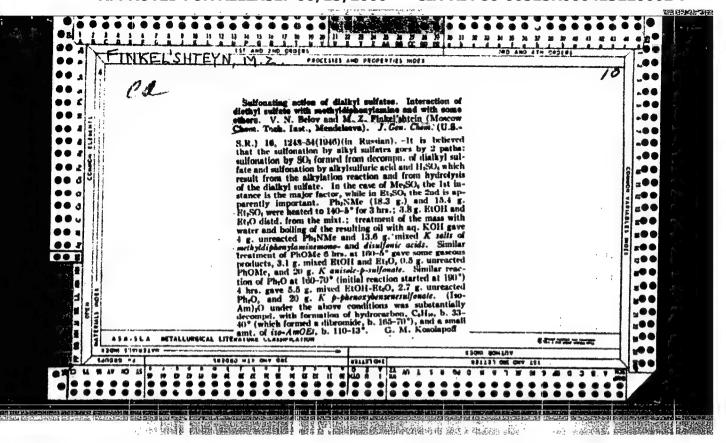
1. Moskovskoye otdeleniye Vsesoyuznogo nauchno-issledovatel'skogo instituta sel'skokhozyzystvennoy mikrobiologii.

(Legumes) (Nitragin)

FINKEL'SHTEYN, M.Z.; TIMOKHIN, I.M.; SATIMBAYEV, R.S.; PODLEGAYEV, I.P.; MALININA, A.I.

Using low-viscosity preparations of parboxylnethylcellulose for stabilizing weighted clay muds. Izv.vys.ucheb.zav.; neft'i gaz 5 no.4:25-27 '62. (MIRA 16:1)

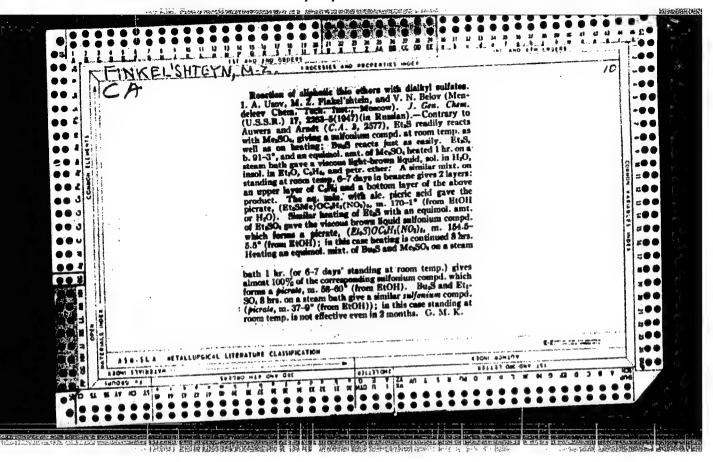
l. Moskovskiy institut neftekhimicheekoy i gazovoy promyshlemnosti imeni akademika I.M.Gubkina, Mamanganskiy zavod iskusstvennogo volokna. (Cellulose) (Oil well drilling fluids)

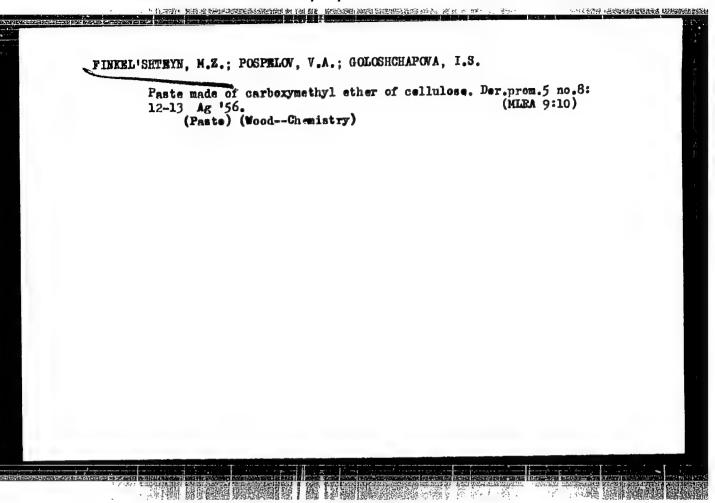


finkelojejn, m. Z

Belov, V. N., and <u>Finkelstein</u>, M. S.-\*On the Sulphonating Action of Dialkylsulphates. IV. Interaction of Diethyl and Dimenthyl Sulphate with Thio-p-Crezol and Thio-3-Naphtol." (p. 746)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1947, Vol. 17, No. 4



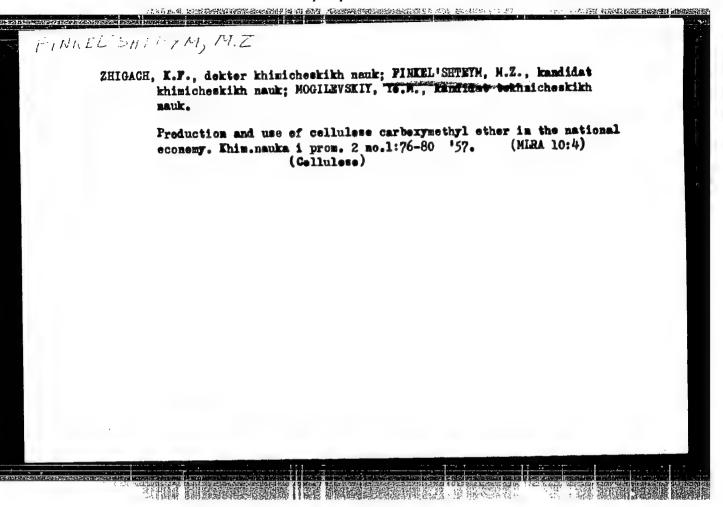


FINKEL'SHTEYN, M. Z.,

Finkel'shteyn, M. Z., K. F. Zhigach, Ye. M. Mogilevskiy, T. A. Tibilova, and A. I. Malinina. "Carboxymethyl Ethers of Cellulose and Their Use in Industry"

Problems of Petroleum Production and Petroleum Engineering, Moscow, Meftyanoy institut, Costoptekhisdat, 1957, 393pp. (Trudy vyp. 20)
This book is a collection of articles written by professors and faculty members of the Petroleum Inst. im I. M. Gubkin.

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413220002-7"

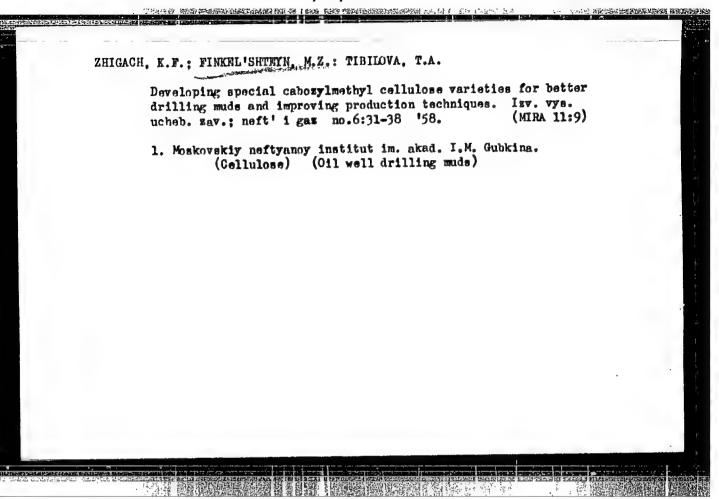


FINXEL'SHTEYN, M.Z., kand.tekhn.nauk; ZHIGACH, K.F., prof., doktor khimichenkikh nauk; MOGILEYSKIY, Ye.M., kand.tekhn.nauk; TIBILOYA, T.A., insh., MALININA, A.I.

Carboxymethyl ethers of cellulose and their use in the national economy. Trudy MNI no.20:67-92 '57. (MIRA 13:5)

(Cellulose)

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413220002-7"



FINKEL' SHTETN, M.Z.; TIMOKHIN, I.M.; MUKHAMEDOV, Kh.U.

Quantitative determination of the sodium salt content of carboxymethyl cellulome. Ixv.vym.uchob.mav.; neft' i gas 1 no.12:
45-50 '58.

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akad.I.M.Gubkina i sovnarkhoz Ferganskogo ekonomicheskogo rayona.

(Gellulome) (Oil well drilling fluids)

5(1,3) SOV/20-123-2-22/50 AUTHORS: Zhigach, K. F., Finkel'shteyn, M. Z., Timokhin, I. M.,

THE PERSONNELSE OF THE PERSON IN THE PERSON IN THE PERSON OF THE PERSON

Malinina, A. I.

TITLE: Production of Carboxy-Methyl Cellulose Fractions and Investi-

gation of Its Physical and Chemical Properties (Polucheniye i issledovaniye fiziko-khimicheskikh svoystv fraktsiy

karboksimetiltsellyulozy)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 2, pp 289-291

(USSR)

ABSTRACT: This water soluble sodium salt of the cellulose carboxy-methyl

ester (CMC) has found widespread use in the last years as a stabilizer, emulsifier, active addition to synthetic detergents, as a glue etc. (Refs 1,2). CMC is a complex polydisperse product consisting of various fractions that differ from each other by their chemical composition (Ref 3) and their physical and chemical properties. CMC can be produced with different values of the esterification and polymerization. Therefore not every CMC type is suited for the purpose. Only single types can be practically used in the one or other branch of industry:

Card 1/4 this must be determined in every single case. The connection

SOV/20-123-2-22/50

Production of Carboxy-Methyl Cellulose Fractions and Investigation of Its Physical and Chemical Properties

一个一个人的主义是一个不可以可以是自己的一种的一种的一种的一种的一种的一种的一种的一种的一种的一种,这一个人们是一种的一种的一种,这种人们是一种的一种,这种人们

between the chemical composition of the CMC samples and their properties and behaviour has remained unexplained until now. These samples almost ever contain a certain amount of small fibers that are difficult to solve and are capable of swelling, the so-called gel-like phase, the content of which can influence in a high degree the properties (especially the rheological properties, Ref 4) of CMC solutions. For these reasons the authors wanted to close this gap. Four samples of CMC were chosen as objects: a) That used for stabilizing loam solutions in drilling (Refs 2,5), b) That serving for the stabilization of silicate salt solutions when drilling into water-endangered and easily sliding soft rocks (Ref 2), and as a glue (Ref 6). c) German samples of the type VHR, d) A special CMC preparation of low viscosity. Besides its fractionation by means of methanol or acetone samples a - c are separated into the geland sol-like phases by centrifuging. I The viscosity, II the stabilizing effect were determined of the fractions obtained. The viscosity of the aqueous solutions of CMC above 0.1% does not obey the Newton law. In the 0.05% solutions investigated

Card 2/4

SOV/20-123-2-22/50

Production of Carboxy-Methyl Cellulose Fractions and Investigation of Its Physical and Chemical Properties

the viscosity anomaly was almost completely lacking. The stabilizing effect of the CMC fractions was determined by the filtration analysis with a pressure drop of 1 atmosphere absolute pressure. Table i gives the results. As may be seen, the fractionation tends to show a heterogeneity of the CMC with respect to the degree of polymerization and esterification. The properties of the fractions change according to rules with the order of the isolation of the latter: lower polymerized fractions are esterified in a higher degree. The fractions produced by precipitation are not of equal value with respect to their stabilizing properties. It was also shown that the gel-like phase has only a weak stabilization and effect. Besides the degree of polymerization and esterification this must be taken into account. The ratio of the gel- and sol-like phase is not only important when used as a stabilizer of loam solutions. The gel-like phase is the most effective when using it as a glue. There are 1 table and 7 references, 4 of which are Soviet.

Card 3/4

SOV/20-123-2-22/50

Production of Carboxy-Methyl Cellulose Fractions and Investigation of Its Physical and Chemical Properties

ASSOCIATION:

Moskovskiy neftyanoy institut im. I. M. Gubkina (Moscow Petroleum Institute imeni I. M. Gubkin)

PRESENTED:

July 3, 1958, by A. V. Topchiyev, Academician

SUBMITTED:

July 1, 1958

Card 4/4

CIA-RDP86-00513R000413220002-7" APPROVED FOR RELEASE: 06/13/2000

5(3),17(3)

AUTHORS: Zhigach, K. F., Finkel'shteyn, M. Z., SOV/20-123-3-25/54

Timokhin. I. M. Malining. A. I.

TITLE:

Carboxy-Methyl Cellulose Preparations for Blood-Substituting Solutions (Polucheniye preparatov karboksimetiltsellyulozy dlya

krovezameshchayushchikh rastvorov)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 3, pp 471-474 (USSR)

ABSTRACT:

The sodium salt of the compound under review (Na-CMC) does not considerably change the blood composition if used as a plasma substitute in animals (Ref 1), even not in considerable excess. Na-CMC, however, was negatively characterized since it causes hypertension on intravenous injection. It was useful to try the synthesis of such preparations which also would yield good

results with regard to their hemodynamic properties.

CMC preparations can be produced with different polymerization degree (PD) and esterification degree (ED). This work was initiated by the institute mentioned in the "Association" together with Tsentral'nyy institut gematologii i perelivaniya krovi = TsOLIPK (Central Institute of Hematology and Blood

Card 1/4

Transfusion) in 1953.

FINNELSMIEN, L. Z., THIGATH, K. F., REBIRLER, F. A. SIRR-SERBINA, V. N., ADEL, I. B., EUERIN, L. K., DERISHEN, V. N., KISTIR, Z. G., (SECTION II)

"Physico-Chemical and Technological Investigations of Fud Fluids
Used for Drilling Wells."

Report submitted the Fifth World Petroleum Congress, 30 May 5 June 1959. New York.

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413220002-7"

ZHIGACH, K.F.; FINKEL'SHTEYN, M.Z.; TIMOKHIN, I.M.

Effect of a low molecular preparation and gel-type fraction of the carboxymethyl cellulose on the stabilizing property of carboxymethyl caters of cellulose in drilling muds. Izv. vys. ucheb. zav.; neft' i gaz 2 no.6:27-31 '59.

(MIRA 12:10)

1.Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akad. I.M. Gubkina.

(Gellulose) (Oil well drilling fluids)

FIMEL'SHTEYN, M.Z.; BORISOV, I.L.

Obtaining cellulose sulfates and studying their effect on drilling mude. Izv.vys.ucheb.zav.; neft' i gas 2 no.11: 49-53 '59.

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni akademika I.M.Gubkina.

(Oil well drilling fluids) (Cellulose)

#### "APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000413220002-7

15.9530

77271 \$0V/63-4-6-5/37

AUTHORS:

Zhigach, K. F. (Doctor of Chemical Sciences), Finkelshteyn, M. Z. (Candidate of Chemical Sciences), Mogilevskiy, Ye. M.,

(Candidate of Technical Sciences) Timokhin, I. M.

THE RESERVE AND PROPERTY AND PROPERTY OF THE P

TITLE:

Water- and Alkali-Soluble Cellulose Ethers

PERIODICAL:

Khimicheskaya nauka i promyshlennost', 1959, Vol 4, Nr 6,

pp 718-725 (USSR)

ABSTRACT:

This is a review of the literature dealing with water- and alkali-soluble cellulose ethers used in the preparation of thickening and stabilizing agents, glues, etc. The solubility of carboxymethylcellulose is determined basically by the degree of its etherification  $\gamma$  and the degree of polymerization DP. The difficulty in obtaining highly substituted carboxymethylcellulose compounds was explained by the fact that in methylation in alkaline and neutral media, the secondary hydroxyl groups have the highest

reactivity, and that both secondary hydroxyl groups can be

Card 1/5

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413220002-7"

Water- and Alkali-Soluble Cellulose Ethers

77271 SOV/63-4-6-5/37

replaced in methylcellulose compounds (Soobshch. VKhO, 1955, Nr 3, p 9). Carboxymethylcellulose compounds consist of fractions with different degrees of etherification and polymerization. Industrial carboxymethylcellulose nearly always contains an admixture of slightly soluble gel fraction. It was established (DAN SSSR, 1958, Vol 123, Nr 2, 289) that the individual fractions have different stabilizing properties when used as stabilizers of the oil well drilling fluids. The gel fraction has low stabilizing properties, and the stabilizing effect of carboxymethylcellulose compounds solution increases with the decreasing content of the gel fraction, notwithstanding the decreasing viscosity of the solution (Izv. vuzov MVO SSSR, Neft' i gaz, 1959, Nr 6). The viscosity depends on the fraction content, and also on the degree of etherification (DAN SSSR, 1959, Vol 126, Nr 5; RZhKh, 1957, p 10029). With increasing degree of etherification ( $\gamma =$ 20 to 200) the viscosity increased to a maximum, decreased

Card 2/5

Water- and Alkali-Soluble Cellulose Ethers

sov/63-4-6-5/37

to a minimum, and then increased again. This was explained by two simultaneously acting factors; namely the increasing degree of the macromolecules' asymmetry, due to the introduction of substituents, and the simultaneous decreasing hydration and asymmetry of the macromolecules. Highly etherified carboxymethylcellulose ( $\gamma$  = 135 and 198) were not thixotropic (RZhKh, 1957, p 10029). The maximum thixotropy was shown by solutions with  $\gamma = 70$ ; this was explained by the maximum symmetry of the macromolecules at this degree of etherification, which enables them to approach and form a thixotropic solution. The thixotropy decreased with the degree of polymerization. Application of carboxymethylcellulose in drilling fluids is discussed. A special type of carboxymethylcellulose was developed which showed a lower water separation rate from clay suspensions than natural stabilizers, such as starch, rosin, and sodium alginate (Novosti neftyanoy tekhniki, neftepromyslovoye delo, Gostopteknizdat, 1952, Nr 9; 1953, Nr 6; 1955, Nr 12; 1956, Nr 9; 1957, Nr 7; 1958, Nr 8).

Card 3/5

Water- and Alkali-Soluble Cellulose Edere

行动机器 \$44.00mm的 18.00mm 14.00mm 医动物性医动物的现在分词 19.00mm

sov/63-4-0-5/37

High-viscosity carboxymethyleeliulose compound type GEC was synthesized lately for the improvement of the rheological properties of clavices or clay-poor drilling fluids; these compounds allow for an increase of the drilling speed and elimination of the complicated and labor-consuming clay handling (Neft. khoz., 1958, Nr 1). The applications of carboxymethylcellulose in the detergent industry (Masiob.-zhir. prom., 1958, Nr 7) and ore flotation (Tsvet. met., 1957, Nr 11) is contemplated in the USSR. Carboxy methylcellulose is also used as thickener for textile printing dyes, in the manufacture of glues, and in numerous other industries. Low-molecular-weight highly pure compounds can be used in the preparation of blood plasma substitutes (Trudy Mosk. instituta neftekhim, i gaz. prom., 1959, Nr 24; DAN SSSR. 1958, Vol 123, Nr 3, p 471). The increase in production of carboxymethylcellulose is hampered, however, by the insufficient production of chloroacetic acid. Various syntheses of cellulose sulfates are reviewed, among them the

Card 4/5

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413220002-7"

COMMINICAL PROPERTY OF THE PRO

Water- and Alkali-Soluble Cellulose Ethers

77271 \$0V/63-4-6-5/37

sulfation of cellulose with sulfuric acid and methanol mixture (Izv. vuzov MVO SSSR, Neft' i gaz, 1959, Nr 11). Carboxyethylcellulose was obtained in reaction of cellulose with acrylonitrile in thepresence of alkali (Avt. svid., 1949, p 77409) and in reaction of acrylonitrile with alkali cellulose (ZhPKh, 1956, Nr 1, p 105). The syntheses of methyl-, ethyl-, and hydroxyethylcellulose as well as mixed cellulose ethers are reviewed. There are 5 figures; and 147 references, 41 U.S., 13 U.K., 1 French, 1 Belgian, 2 Dutch, 3 Canadian, 2 Swiss, 8 Swedish, 1 Japanese, 1 Austrian, 18 German, 56 Soviet. Recent U.S. and U.K. references are: E. H. de Butts, J. A. Hudy, J. H. Elliott, Ind. Eng. Chem., 49, Nr 1, 94 (1957); Chem. Eng. News, 35, Nr 4, 78 (1957); Chem. Trade J., Nr 3620, 905 (1956); Chem. Eng. News, 34, Nr 36, 4253 (1956); J. Swintosky, A. Kaufman, J. Am. Pharm. Ass., 44, Nr 9, 540 (1955).

Card 5/5

ZAYTSEVSKAYA, M.M.; FINKEL'SHTEYN, M.Z.; TIMOKHIN, I.M.

Use of the sodium salt of carboxymethylcellulose in the manufacture of wallpaper. Bum. prom. 34 no.11:9-10 N '59. (MIRA 13:3)

l. Moskovskiy filial TSentral'nogo nauchno-issledovatel'skogo instituta tsellyuloznoy i bumazhnoy promyshlennosti (for Zaytsevskaya). 4. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. I.M. Gubkina (for Finkel'shteyn, Timokhin).

(Vallpaper) (Cellulose)

SOV/20-126-5-31/69

5(4) AUTHORS: Zhigach, K. F., Finkel'shteyn, M. Z., Timokhin, I. M.

TITLE:

The Structural Viscosity of Aqueous Solutions of Carboxymethyl

Cellulose (Strukturnaya vyazkost' vodnykh rastvorov

karboksimetiltsellyulozy)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 5, pp 1025-1028

(USSR)

ABSTRACT:

A previous paper (Ref 1) pointed out that carboxymethyl cellulose (CMC) exhibits anomalous viscosity at concentrations exceeding 0.1% in aqueous solutions. Now the effect of the individual fractions of CMC with varying degree of polymerization are investigated with respect to the structure of the solution. Four samples were selected: (1) high-molecular, (2) gelshaped, (3) sol-shaped, and (4) low-molecular CMC (Table 1). The viscosities measured at different velocity gradient G (viscosimeter by Pinkevich) confirm F. Höppler's opinion (Refs 2,3), i.e., the viscosity of high-molecular CMC depends on G, and this dependence increases with increasing concentration. Sample 2 shows the highest degree of anomaly, whereas sample 4 exhibits the least dependence on G (Table 2). Accord-

Card 1/3

SOV/20-126-5-31/69 The Structural Viscosity of Aqueous Solutions of Carboxymethyl Cellulose

7、TO 15工程 电影响用的现在形式 医眼性 医眼性 医动物 医动物 医动物性皮肤 电影 计注意 (1970年1975)

ing to Pasynskiy and Rabinovich (Ref 4) this structural viscosity can be represented by the tangent of the angle of inclination  $\alpha$  in the coordinate system  $\gamma_1$  - 1gG. Table 3 gives the values for tga, and besides the calculated dynamical shearing stress . It is concluded that the structural viscosity is caused by the gel fraction and the interaction of the gel particles. The attempt was made to eliminate the interaction of gel particles by the addition of sample 3 or 4 and by adsorption of the low-molecular particles to the gel particles. This was a success as figures 2,3,4 and table 5 show. Only at high concentrations of sample 4 viscosity increases again, which is explained by complete saturation of the gel particles. Thus, the increased concentration of the CMC becomes effective. The results obtained show that by a proper arrangement of CMC fractions it is possible to control the properties in the desired way. There are 4 figures, 5 tables, and 7 references, 4 of which are Soviet.

ASSOCIATION:

Institut neftekhimicheskoy i gazovoy promyshlennosti im. I. M. Gubkina (Institute of Petroleum-chemical and Gas Industry

Card 2/3

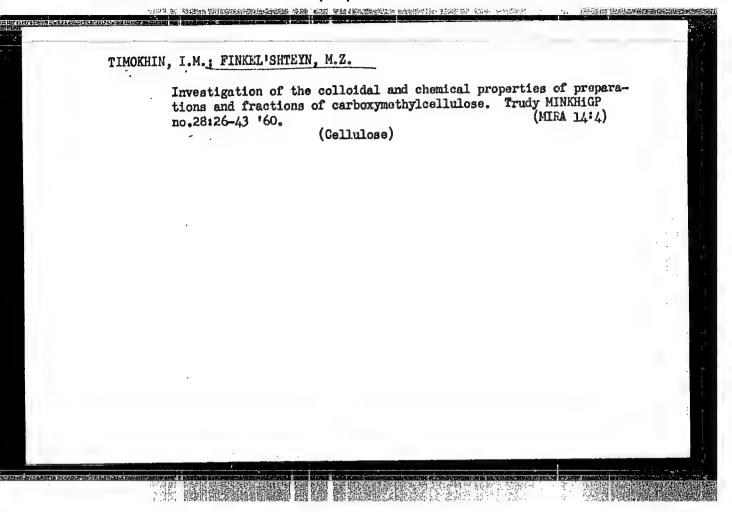
imeni I. M. Gubkin)

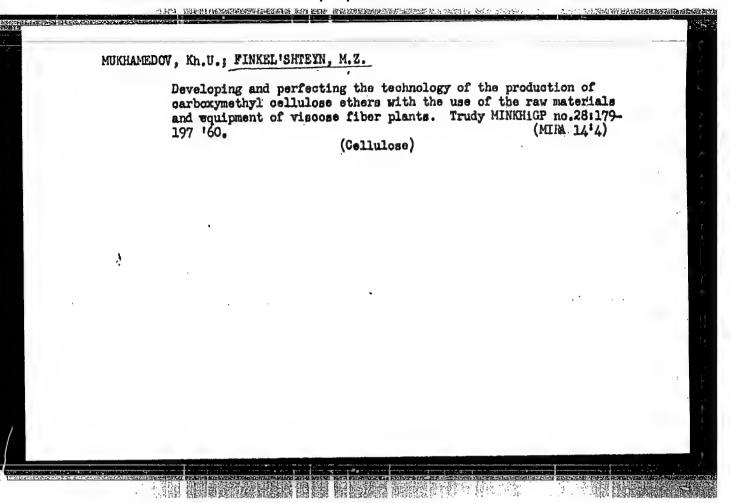
# FINKEL'SHTEYN, M.Z.; TIMOKHIN, I.M.

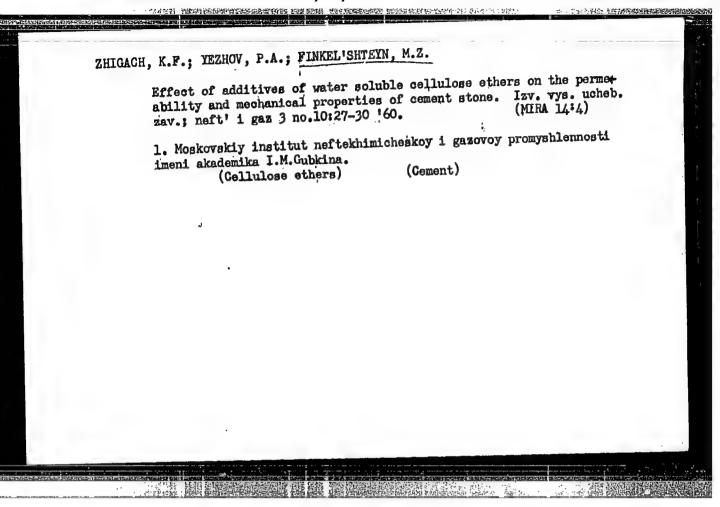
Obtaining carboxymethyl esters of cellulose from poor grades of raw cellulose. Izv. vys. ucheb. zav.; neft' i gaz 3 no.12:35-37' 160. (MIRA 14:10)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni akademika I.M. Gubkina.

(Cellulose)
(Oil well drilling fluids)







化非常的变形 医内部性动物 医中枢性 医多种性 医皮肤 医皮肤 医皮肤 医皮肤 医皮肤 化二甲基苯酚

BUNIN, A.Ya., kand.med.nauk; YAKOVLEV, A.A., nauchnyy sotrudnik; POZHARSKAYA, A.M., kand.kim.nauk; CHERNIK, L.Ye., nauchnyy sotrudnik; FINKEL'SHTEYN, M.Z., kand.khim.nauk; TIMOKHIN, I.M., kand.khim.nauk; nauk

Method for increasing and prolonging the hypotensive action of pilocarpine. Vest.oft. no.4:63-65 161. (MIRA 14:11)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut glaznykh bolezney imeni Gel'mgol'tsa (for Bunin, Yakovlev). 2. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze (for Pozharskaya, Chernik). 3. Institut neftekhimicheskoy i gazovoy promyshlennosti imeni I.M. Gubkina (for Finkel'shteyn, Timokhin).

(PILOCARPINE)

DKHARIYAL, Ch.D.; ZHIGACH, K.F.; MALININA, A.I.; TIMOKHIN, I.M.; FINKEL!SHTEYN, M.Z.

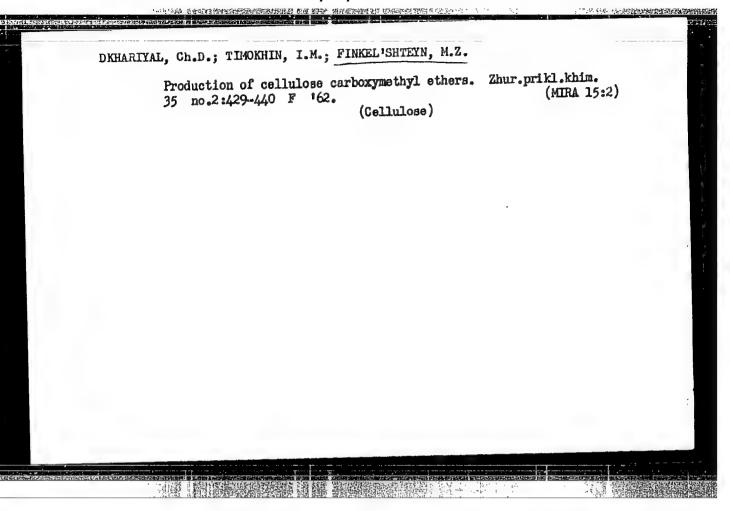
Effect of production techniques of carboxymethylcellulose on its etherification and solubility in water. Izv.vys.ucheb. zav.; neft! i gaz 5 no.2:29-34 '62. (MIRA 15:7)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni akademika I.M. Gubkina. (Cellulose)

FINKEL'SHTEYN, M.Z.; DKHARIYAL, Ch.D.; TIMOKHIN, I.M.; MALININA, A.I.

Effect of successive additions of reagents and the degree of polymerization of cellulose on the degree of esterification and solubility of carboxymethylcellulose in water. Izv. vys. ucheb. zav.; neft' 1 gaz 5 no.11:31-34 '62.

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni akademika I.M. Gubkina.



#### h1h13

S/069/62/024/005/004/010 B106/B186

157400

AUTHORS:

Zhigach, K. F., Luft, B. D., Finkel'shteyn, M. Z., Goloshchapova, I. S., Timokhin, I. M., Chuvilina, L. B.

TITLE:

Investigation of aqueous alundum suspensions stabilized by curboxy-methyl cellulose for electrophoretic coating

PERIODICAL:

Kolloidnyy zhurnal, v. 24, no. 5, 1962, 558 - 564

TEXT: The effect of several physicochemical characteristics of sodium carboxy-methyl cellulose (Na-CMC) on its efficiency as a stabilizer for aqueous suspensions of alundum for electrophoretic coating was studied. The sedimentation stability of the suspension is raised with increasing degrees of polymerization, etherification, and Na-CMC concentration in the suspension. Greater thickness of coatings is obtained with an increasing degree of polymerization of Na-CMC, while increasing etherification resulted in thinner coatings. The homogeneity of coatings improves with a lower degree of polymerization, and a higher degree of etherification and Na-CMC concentration. The anodic gas evolution, which is very detrimental to the quality of coatings, increases with etherification and Na-CMC concentration

Card 1/3

S/069/62/024/005/004/010 B106/B186

Investigation of aqueous alundum...

in the suspension, and is reduced by an increasing degree of polymerization. The resistance of coatings to 0.05 N NaOH increases with concentration. degree of polymerization, and etherification of Na-CMC. Electronmicroscopic measurements showed that the stabilizing effect of Na-CMC is based on the adsorption of high-molecular ions (CMC) to the alundum particles, and on the formation of structurized protecting gels which prevent the joining of the individual particles. The best coatings are obtained by stabilizing the alundum suspensions with purified Na-CMC having a degree of polymerization of 500-550 and a degree of etherification of 70-80 in a concentration of 0.3-0.5% of the aqueous phase. The results were used in developing a new industrial technique of producing electrophoretic insulating coatings from aqueous alundum suspensions on parts of electron tubes. Thus, the use of toxic and inflammable organic solvents and of nitrocellulose can be abandoned. There are 8 figures and 1 table. The English-language reference is: L. E. Grey, Electronic. Eng. 26, 402, 1954.

ASSOCIATION: Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. I. M. Gubkina (Moscow Institute of Petrochemical and Gas Industry imeni I. M. Gubkin)

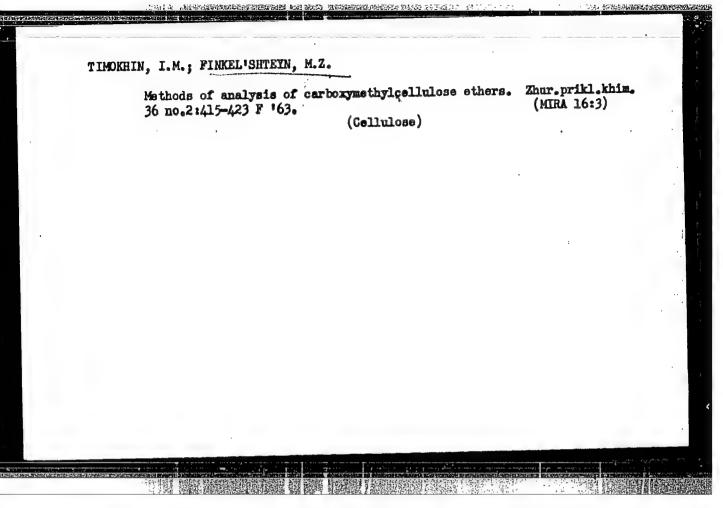
Card 2/3

### "APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000413220002-7

Investigation of aqueous alundum... \$/069/62/024/005/004/010
SUBMITTED: April 22, 1961

Card 3/3



DKHARIYAL, Ch.D.; MALININA, A.I.; TIMOKHIN, I.M.; FINKEL'SHTEYN, M.Z.

Effect of some factors on the reaction rate of carboxymethylation of cellulose and the homogeneity of carboxymethylcellulose. Zhur. prikl. khim. 36 no.11:2513-2517 N '63.

(MIRA 17:1)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni I.M. Gubkina.

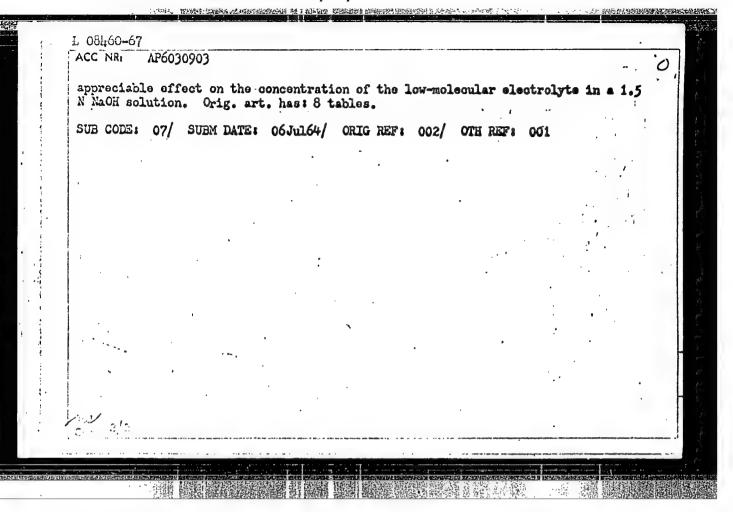
DKHARIYAL, Ch.D.: ZHIGACH, K.F.; MALININA, A.I.; TIMOKHIN, I.M.; FINKEL:SHTEYN, M.Z.

Factors influencing the effectiveness of cellulose carboxymethylation. Zhur.prikl.khim. 37 no. 5:1099-1105 (MIRA 17:7)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni I.M.Gubkina.

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413220002-7"

ACC NR AP6030903 SOURCE CODE: UR/0080/66/039/008/1849/1852 AUTHOR: Dkhariyal, Ch. D.; Malinina, A. I.; Timokhin, I. M.; Finkel'shteyn. M. Z. ORG: Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin (Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti) TITIE: Effect of the conditions of preparation of carboxymethylcellulose (CMC) on the degree of its polymerization ( SOURCE: Zhurnal prikladnoy khimii, v. 39, no. 8, 1966, 1849-1852 TOPIC TAGS: cellulose, polymer degradation, polymerization degree ABSTRACT: A study of the effect of the mercerization temperature showed that as the latter risos, the degree of polymerization of carboxymethylcellulose (CMC) diminishes. This is attributed to the high rate of degradation of cellulose during its mercerization at higher temperatures. In the process of carboxymethylation of cellulose, a rise in the reaction temperature to 80 °C reduces the degradation of the CMC obtained. At 95°, however, the degradation is more pronounced. The degree of polymerization of CMC decreases very appreciably with rising content of free NaOH in the reaction mixture. It does not change with changing cellulose/ClCH2COOH ratio and changes only slightly with the water/cellulose ratio. Ultrasonic waves 7(19.45 kc) had no effect on the polymerization. It is shown that the degree of polymerization of CMC can be determined in unpurified preparations, since the impurities they contain do not have any 1/2 Card UDC: 547.458.81+541.64



FINKEL'SHTEYN, N.A.; BERGMAN, A.G.; NAGORNYY, G.I.

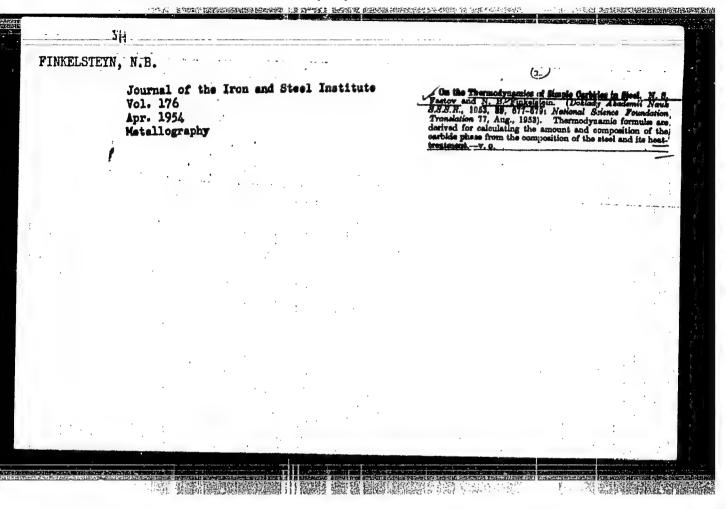
Interaction between potassium, calcium, and barium sulfates. Zhur.neorg.khim. 10 no.8:1890-1894 Ag 65.

Interaction between fused chlorides and sulfates of potassium, calcium, and barium. Ibid. \$1895-1900. (MIRA 1921)

1. Irkutskiy gosudarstvennyy universitet i Rostovskiy-na-Donu institut sel'skokhozyaystvennogo mashinostroyeniya. Submitted July 4, 1964.

### "APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000413220002-7



USSR/Microbiology - General Microbiology

F-1

Abs Jour

: Ref Zhur - Biol., No 10, 1958, 43094

Author

: Zamukhovskaya, A.N., Shvartsman, L.A., Finkelshteyn, N.R.,

Kasyanova, L.K.

Inst

. .

Title

: Biological Properties of B. Coli When Cultivated on a

Liquid Medium with Aeration.

Orig Pub

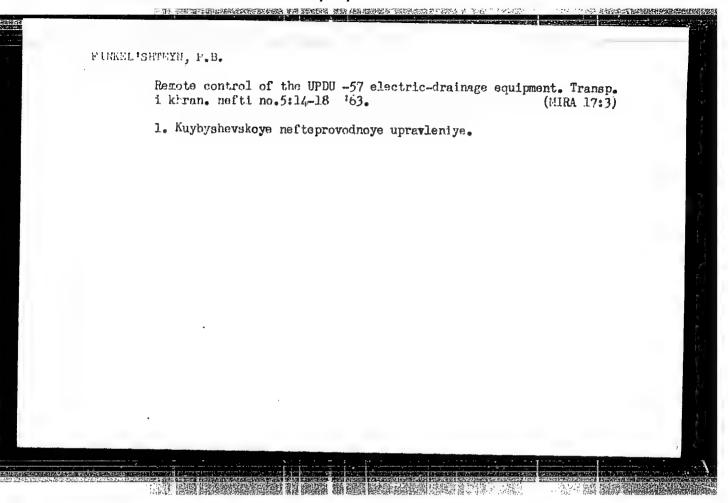
: Tr. Mosk. n.-i. in-ta vaktsin i syvorotok, 1956, 8, 191-

201.

Abstract

: No abstract.

Card 1/1



68-58-3-2/22

AUTHORS: Finkel'shteyn, P.K. and Prudenko, V.A.

TITIE: A New method of Determining the Caking Index and the Degree of Metamorphism (Rank) of Coals (Novyy metod opredeleniya pokazateley spekayemosti i stepeni meta-

· 经证据证据 (1945年) 表现证明的 (1945年) [1945年 | 1945年 | 1945年

morfizma ugley)

PERIODICAL: Koks i Khimiya, 1958, Nr 3, pp 6 -12 (USSR).

ABSTRACT: A method of rapid and accurate determination of the yield of carbonisation products using a lg sample of coal was developed. The description of the apparatus (Fig.1) and experimental procedure are given. On the assumption that the amount of tar evolved during semi-coking is proportional or even equal to the amount of liquid products responsible for coal plasticity and the amount of oxygen containing products of the smallest molecular weight (pyrogenic H<sub>2</sub>O and CO<sub>2</sub> and CO) is proporticulated to that part of the coal substance which is unstable and does not participate in the formation of plastic mass, two new indices characterising the coking properties of coal are proposed. Plasticity index:

Card 1/3

THE PROPERTY OF THE PROPERTY O

A New Method of Determining the Caking Index and the Degree of ... 68-58-3-2/22 Metamorphism (Rank) of Coals

$$\frac{\tan \% (100 - ash)}{\left[ H_2 0 \% + (CO_2 + CO)\% \right]}$$
 and fluidity index =

Plasticity index · 100
Yield of semicoke %

As the analysis of the gas evolved from a lg sample of coal during semi-coking for CO and CO<sub>2</sub> is impossible, a relationship between the gas density and its CO + CO<sub>2</sub> content for various volatile matter contents of coals was established (Fig.2), on the basis of which the formula for plasticity index takes the following form:

Plasticity index =  $\frac{\tan \% (100 - ash)}{\left\{ \text{pyrogenic H}_20 \% + \left[ v(d - 0.6) \cdot 0.15 \right] \% \right\} - 100}$  where v - volatile matter content of coal.

68-58-3-2/22

A New Method of Determining the Caking Index and the Degree of Metamorphism (Rank) of Coals

The plasticity coefficient was correlated with the thickness of the plastic layer for the majority of coals (Table 1). A new index of the degree of metamorphism of coals (rank) was also proposed - this is the ratio of the sum of pyrogenic water and carbon monoxide and dioxide obtained on coking to 555 °C expressed in weight percent to the ash-free coal substance. It is claimed that this index of mak is more sensitive than that based on the volatile matter content of coal (Tables 2 and 3). There are 3 tables, 2 figures and 6 Soviet references.

ASSOCIATION: Dnepropetrovskiy khimiko-tekhnologicheskiy institut: (Dnepropetrovsk Institute of Chemical Technology)

Card 3/3

FINKEL'SHTEYN, P. K. Cand Tech Soi -- (diss) "I haw method of determining the indexes of the coking capacity and degree of metamorphism of coal."

Dnepropetrovsk, 1959. 23 pp with graphs (Min of Higher Education UNSSR.)

Dnepropetrovsk Chem rechnological Inst im F. E. Dzerzhinskiy), 100 copies (KL, 45-59, 147)

-60-

SARONUTANISH PROPERTY OF THE ANGEST OF BEST AND A

AUTHOR: Finkel'shteyn, P.K. SOV/68-58-2-3/20

TITIE:

A Laboratory Method for Forecasting the Size of Coke

(Laboratornyy metod prognoza krupnosti koksa)

PERIODICAL:

Koks i Khimiya, 1959, Nr 2, pp 10 - 13 (USSR) ABSTRACT: On the assumption that the formation of macrocracks governing the size distribution of coke depends on the fluidity of plastic layer and the yield of tar on semi-coking (providing that other conditions are constant), the author proposes a formula for an index K a characterising the size distribution of coke:

where T - fluidity index of plastic layer, of tar on semi-coking in % on dry coal. determined by the method proposed by the author and Prudenko (Koks i Khimiya, 1958, Nr 3). The coefficient K determined for a number of coals is given in Table 1. comparison of determined and calculated (from values for individual coals) coefficient K for a number of blends

Card1/2

A Laboratory Method for Forecasting the Size of Coke

prepared in the laboratory (Table 2) indicated that it is an additive property. The coefficient was determined for a number of blends used in various coking works and compared with the size distribution of industrial cokes produced from these blends (Table 3).. A straight line relationship between the percent of the above 60 mm fraction of coke and K index of the corresponding blend is claimed to exist. It is proposed to use the above relationship for the forecasting of the size distribution of coke. The actual yield of + 60 mm fraction did not differ more than 3% from the forecast yield with the exception of two cases when the difference amounted to 5 and 6%. There are 3 tables.

ASSOCIATION: Dnepropetrovskiy khimiko-tekhnologicheskiy 1nstitut (Dnepropetrovsk Institute of Chemical Technology)

Card2/2

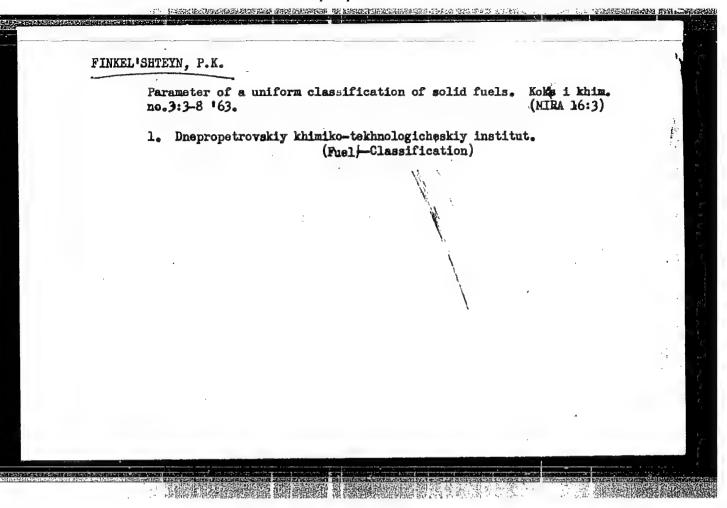
THE PARTY PROPERTY OF THE PROPERTY OF THE PARTY OF THE PARTY PROPERTY OF THE PARTY PARTY OF THE PARTY OF THE

DAL', V.I.; FINKEL'SHTEYN, P.K.; GOLENDA, V.F.; POPOV, R.I.; PASHKEVICH, . A.Z.; KOHRADI, V.Ya.

Increasing the size of metallurgical coke by a new method of selecting coal charges. Koks i khim. no.1:22-27 '60. (MIRA 13:%)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut (for Dal', Finkel'shteyn & Golenda). 2. Dnepropetrovskiy koksokhimicheskiy savod (for Popov, Pashkevich and Konradi).

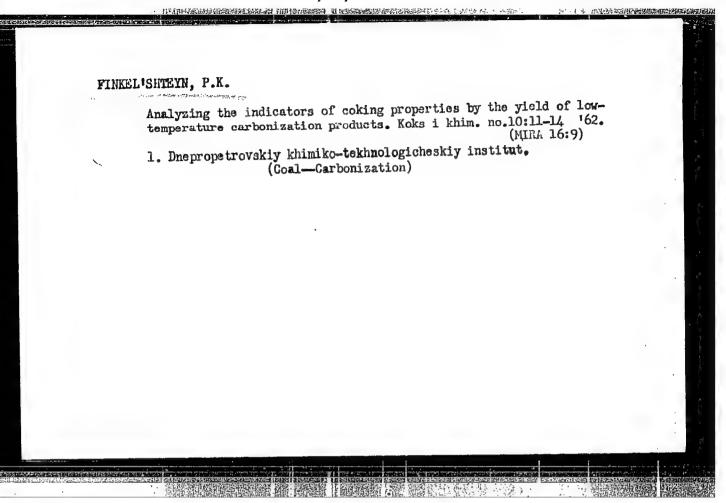
(Dnepropetrovsk--Coke)



FINKEL'SHTEYN, P.K.; GOLENDA, V.F.; STARUSHKINA, N.A.

New classification indices for Donets Basin coals. Koks i khim.
no.9:6-10 '63.

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.
(Donets Basin-Coal-Classification)



LITVIN, I.S., inzh.; BLANK, I.I., inzh.; KORNILOV, B.B., inzh.; FINKEL!-SHTEYN, R.I., inzh.

Precast reinforced concrete standardized foundations for turbogenerators with 50 to 300 thousand kw. power ratings. Energ. stroi. no. 32:7-15 '62. (MIRA 16:5)

1. Leningradskoye otdeleniye Vsesoyuznogo gosudarstvennogo proyektnogo instituta stroitel'stva elektrostantsiy.

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413220002-7"

S/124/63/000/002/025/052 D234/D308

AUTHOR:

Finkel'shteyn, R.M.

TITLE:

The stressed state of a circular cylindrical shell

having initial deviations from regular form

PERIODICAL:

Referativnyy zhurnal, Mekhanika, no. 2, 1963, 9, abstract 2V56 (In collection: Issled. po uprugnosti i plastichnosti. 1. L., Leningrad. un-t, 1961, 169-

174)

TEXT: The author estimates the error in the determination of additional stresses in a cylindrical shell having initial deviations coinciding with the form of loss of stability. It is shown that the initial system of equations, on the basis of which the above solution is obtained, is applicable only if the rotations and elongations of elements of the shell are of the same order and are small compared with 1. Then the errors in the expressions for additional forces and moments do not exceed the standards admissible in engineering design. An estimation of the permissible initial deviation

Card 1/2

<u> </u>	WASHINGTON THE TOTAL OF THE TOT	onienska v Regenere selska	"新疆·格里拉索·斯勒克·克特特·马克·特尔·拉马·	TO THE SMERGER PROPERTY SHAPETER
The stre	essed state		S/124/63/000/00 D234/D308	2/025/052
	ined on condition	that the elonga		
as the s	equare of the rotal	ations, and that	the system of e	quations
deviation deviation	on in this case comended star	an be assumed to	be several time	s larger
Abstr	acter's note: Com	plete translatio	n_7	
		가는 한 경험 개계를 받는다. 1945년 4 기가 기계를 받는다.		
	2	The state of the s	and the second s	33.0
		Anne e New Year		and the second of the second of the second
Chiorographic (W. Sorge Fire)	The state of the s			

S/753/61/000/001/005/QP7

AUTHOR: Finkel'shteyn, R.M.

TITLE: On the stress distribution in a circular cylindrical shell having an

initial deviation from its regular shape.

SOURCE: Leningrad. Universitet. Matematiko-mekhanicheskiy fakul'tet.

Issledovaniya po uprugosti i plastichnosti. no.1. 1960, 169-182.

TEXT: The paper provides theoretical means for the calculation of the supplementary stress distribution introduced by the so-called initial deviations, which are defined as those normal displacements which would have to be imparted to a geometrically ideal, regular, shell to make it coincide with an actual shell. The great variety of such deviations precludes a general solution. However, the upper limit of the magnitude of such stresses can be determined fairly easily. This upper limit coincides with those deviations that are consistent with the shape of the shell when buckling. The subject paper constitutes an evaluation of the errors incurred in the respective solutions provided recently by M. M. Genne and V. F. Segal'. The Genne-Segal' equations for the forces and moments arising in (a) a smooth, and (b) a ribbed circular cylindrical shell with small initial deviations are reproduced, together with the system of differential equations from which they are derived.

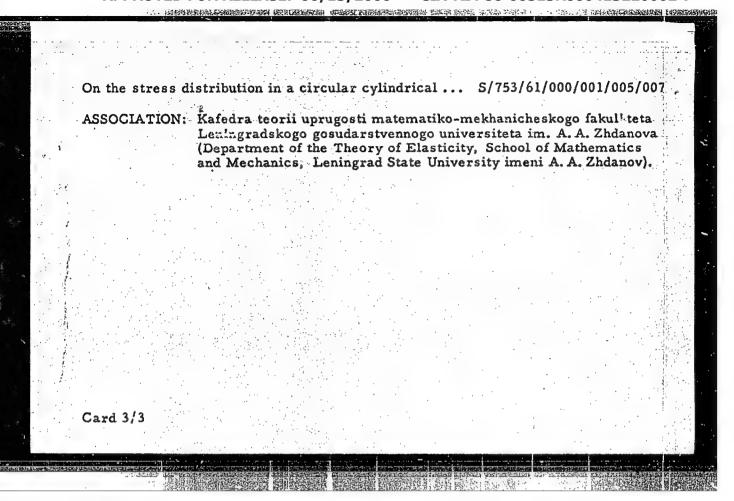
Card 1/3

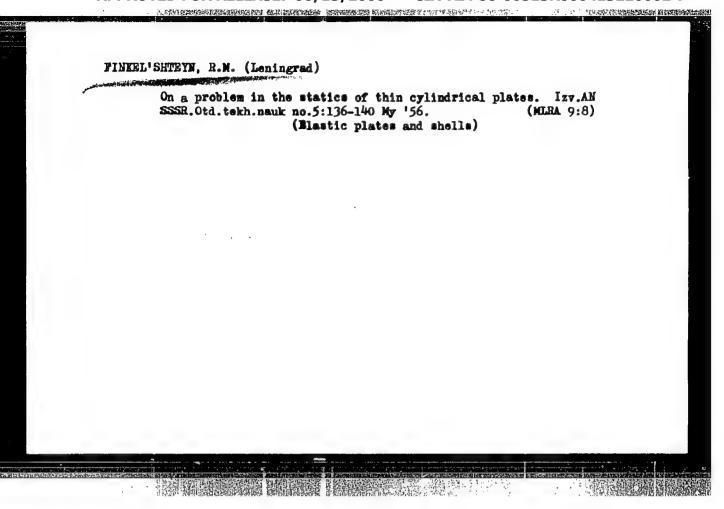
をに

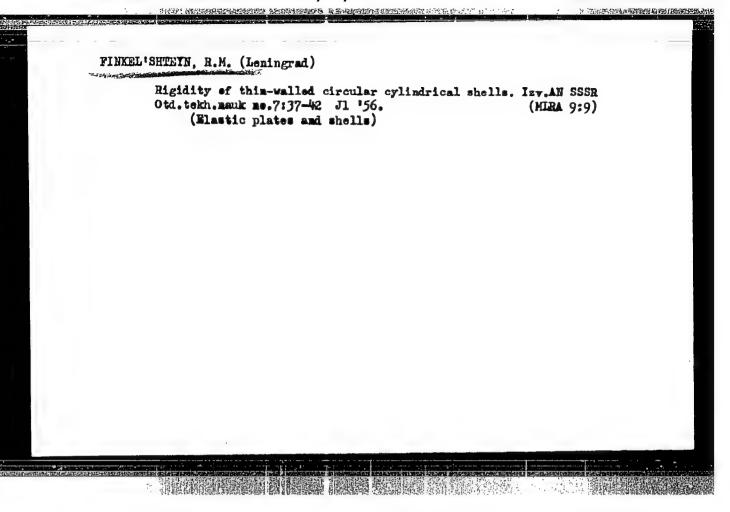
On the stress distribution in a circular cylindrical ... S/753/61/000/001/005/007

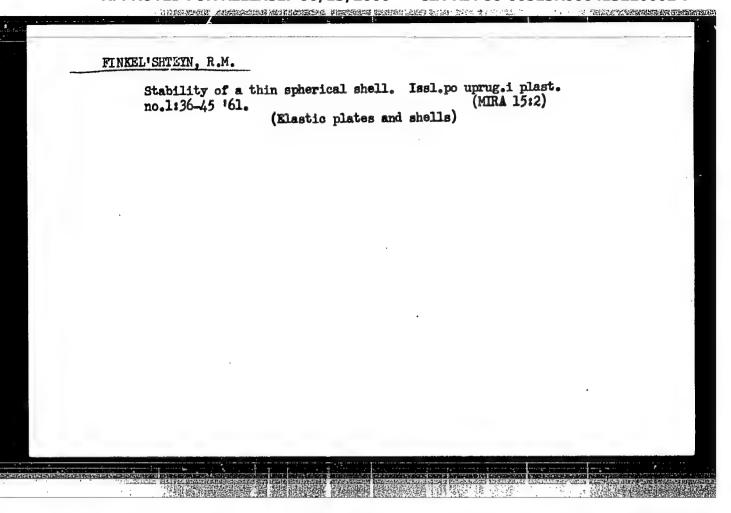
Following the Genne-Segal assumptions that the rotations of the shell elements occurring in the process of deformation will be small relative to unity and that the order of smallness of the elongations and the rotations is the same, it is deteat mined that the above-cited differential equations can be applied only when the rotations are equivalent in magnitude to the deformations. Thereupon error equations for the two Genne-Segal' equations are established, and the actual error magnitudes are determined for the initial deviations specified by Yu. A. Shimanskiy (In "Stroitel'naya mekhanika podvodnykh lodok," The structural mechanics of Mubmarine vessels, Sudpromgiz, 1948). Using the smallness criterion for the supplementary forces as expressed in terms of the initial deviations, the P. F. Papkovich coefficient, and the number of waves determined by the buckling mode of the shell at large deflections, the magnitude of the permissible initial deviations is roughly estimated, and it is found that the initial deviation must be of the order of the thickness of the shell skin for a smooth cylinder and must be approximately 1/60 of the radius of the cross-section of a ribbed cylinder and, hence, about 6.5 times greater than the value specified in Shimanskiy's textbook. There are no figures or tables; there are 3 Russian-language Soviet references, including V. V. Novezhilov's textbook "Teoriya gibkikh obolochek" (Theory of flexible shells), Sudpromgiz, 1951, and "Osnovy nelineynyy teorii uprugosti" (Fundamentals of the nonlinear theory of elasticity), Gostekhizdat, 1948, and the author's above-cited textbook.

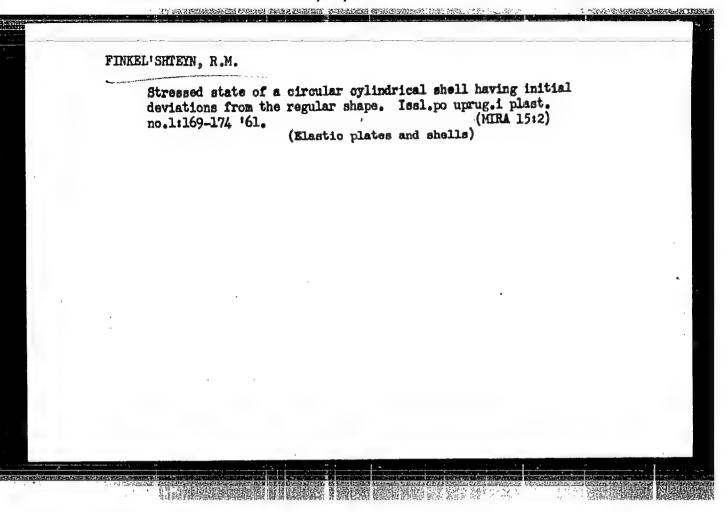
Card 2/3











NOVOZHILOV, Valentin Valentinovich; FINKEL'SHTEYN, H.M., kand. tekhn.
nauk, retsenzent; CHERNYKH, K.F., nauchnyy red.; KLIORINA, T.A.,
red.; FRUMKIN, P.S., tekhn. red.

[Theory of thin shells] Teoriia tonkikh obolochek. 2., dop. izd.
leningrad, Sudpromgiz, 1962. 430 p. (NIRA 15:6)

(Elastic plates and shells)

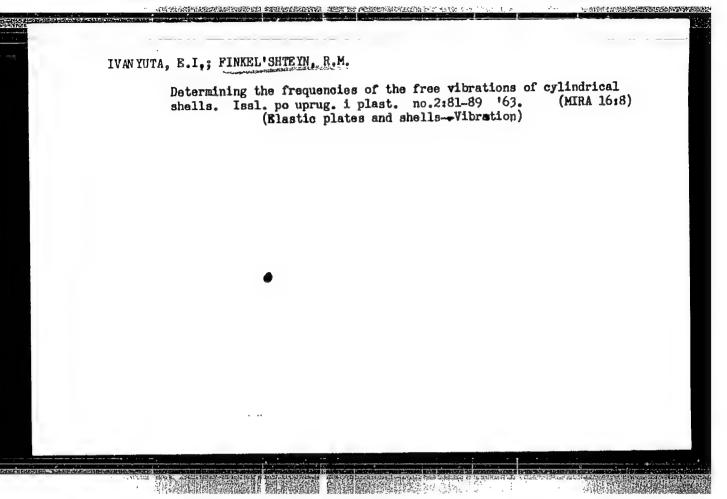
# IVANYUTA, E.I.; FINKEL'SHTEYN, R.M. Determining the frequencies of free vibrations of a cylindrical shell with elliptic cross section. Issl.po uprug.i plast. no.l:46-51 '61. (MIRA 15:2) (Elastic plates and shells—Vibration)

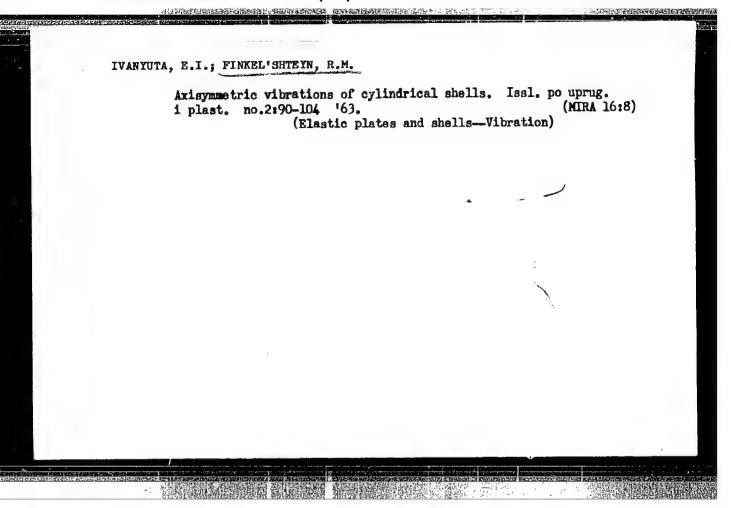
IVANTUTA, E. I. (Leningrad); FINKEL'SHTEIN, R. N. (Leningrad)

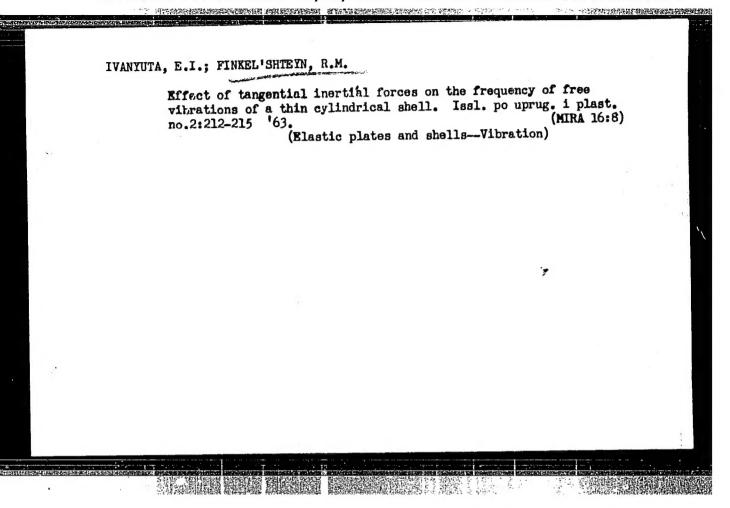
Using a variational method in solving certain problems in the theory of shells. Prykl. mekh. 9 no.1:42-51 '63. (MIRA 16:4)

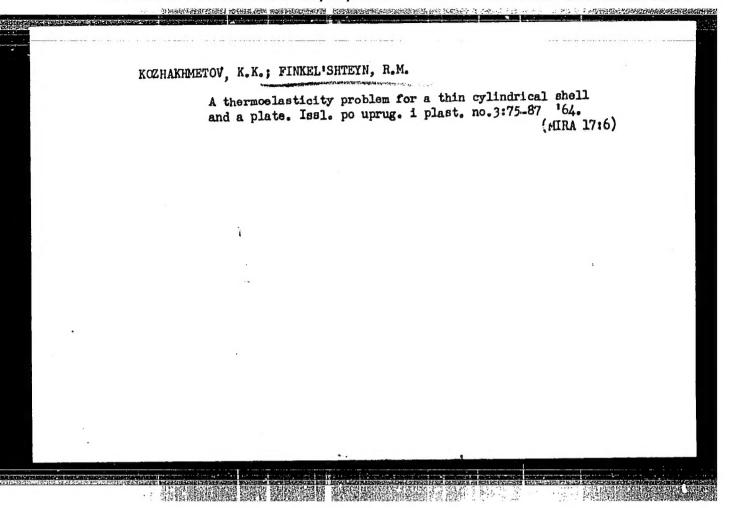
1. Leningradskiy gosudarstvennyy universitet.

(Elastic plates and shells)









FINKEL'SHTEYN, SIA. 118-58-5-4/18 Finkel'shteyn, S.A., Engineer, AU PHOR: Lumber Transport Roads of Reinforced Concrete Plates (Leso-TITLE: voznyye doregi iz shelezobetonnykh plit) Mekhanizatsiya Trudoyemkikh i Tyazhelykh Rabot, Nr 5, 1958, PERIODICAL: pp 14-15 (USSR) The haulage of lumber to storage places is accomplished by ABSTRACT: automotive means over corduroy roads. Recently many of these roads have been built, but have proved to be of sittle use even for such vehicles as ZIL-150 and ZIL-151. They are also expensive and need frequent regair. The author mentions the Shiglino corduroy road of the Rabayevo leapromkhoz, Cherepovetsles kombinat (Cherepoveteles Combine) as examples. He then points to the good experience with roads of reinforced concrete plates. The average cost of 1 km was 183,000 rubles which included 136,000 rubles for the manufacture of the plates. As the plates can serve 3 years and can be moved within this period at least 6 times, the cost of 1 km of miter will be twice as low as that of cordurey reads. The cost of plate manufacture can also be considerably reduced Card 1/2

Lumber Transport Roads of Reinforced Concrete Plates 118-58-5-4/18

thus lowering costs still further. There are 2 photos.

AVAILABLE: Library of Congress

Card 2/2 1. Reinforced concrete-Applications 2. Roads-Precast concrete 3. Wood-Processing